discussed and investigated. A group of experts is convened and, on the basis of a preliminary discussion, questionnaires are sent out and every bit of factual information obtainable is collected and collated, so that when a major conference is held, no delegate, if he reads his rather bulky parcel of literature, is likely to get his statistics wrong, or to be unaware of views which are widely held in countries other than his own.

The object of the review is to boil down this factual material to reasonable bulk without introducing any false emphasis. While the bulk remains considerable the absence of bias is of the kind one would expect of a Civil Service report—the proportion of inspiration to perspiration is low and there is little that could be the subject of adverse criticism or could offend religious or political prejudice. Every term is defined commencing with Prevention, Juvenile and Delinquency. It is not found possible to make any reliable estimate of the incidence of juvenile delinquency but the assumption is made that it is increasing. It is mentioned that delinquency may be due to constitutional and environmental factors, the former being mentioned at an appropriate stage and then forgotten. Every possible environmental factor is described and illustrated by an excellent selection of quotations representative of different points of view. It is concluded that more research is necessary, more co-ordination of effort, more money and more organization. With this magnificent source-book as the basis of their discussions delegates will by now have taken their various prejudices to Geneva and will have for the most part taken them home again. It is said that to generate a new idea the facts must first be assembled and assimilated and that the generator should then sleep on the matter. This is a fine document to sleep upon. Its main value, however, is as a unique source of statistics and references about work in countries with whose cultural attitudes and literature we are not familiar. Were it equipped with an index and a bibliography at the end, it would serve this purpose much better.

ALEXANDER KENNEDY.

NUCLEAR RADIATIONS

Oughterson, Ashley W. and **Warren, Shields** (Editors). *Medical Effects of the Atomic Bomb in Japan.* National Nuclear Energy Series; Manhattan Project Technical Section. Division VIII—Volume 8. New York and London, 1956. McGraw-Hill. Pp. xvi + 477. Price 60s.

THIS book, the work of two authors with a unique experience of the medical sequelæ of the two atomic weapons used against Japan in 1945, is outstanding in many ways.

It provides comprehensible factual descriptions of the clinical syndromes encountered amongst victims of the nuclear weapons attacks on Hiroshima and Nagasaki in August 1945.

Commencing with a clear analysis of the physical damage which occurred in the two cities (contrasting the effects over the broad flat delta of Hiroshima with the effects on the hills, intervening valleys and harbours which constitute the area of Nagasaki); this geographical background combined with studies of local population densities and available sheltering facilities is then correlated with the medical sequelæ, supported by a wealth of photographs, tables and graphs.

The clinical observations and case-histories recorded at Hiroshima and Nagasaki have never previously been reproduced with such clarity and precision. As no evidence of any indirect effects such as fall-out were recorded at the two sites, these studies are necessarily confined to the *direct* effects of the weapons.

A series of representative case-histories accompanied by appropriate ætiological data and clearly reproduced monochrome and coloured photographs, produce (in the opinion of the reviewer) the best available records of the effects of blast, heat and ionizing radiations. In particular the effects of ionizing radiations upon the more susceptible organs and tissues: skin, hæmatopoietic tissues, lens of the eye and gonads are very thoroughly explored. The occurrence of radiation cataract amongst ninety-eight Hiroshima patients correlates with the observations made else-

where that cataracts have followed treatment with large doses of X-rays.

Admirable studies of bone marrow and peripheral blood throw light upon the hæmatological changes which are alleged to follow large amounts of ionizing radiation. Strong support is adduced of the dangers of leukemogenesis in man following ionizing radiation in the lethal dose range.

These effects may not appear until many years after exposure. Moloney, W. C., and his co-workers at Hiroshima described ninety-two cases of leukæmia amongst the exposed populations in the two incidents. These cases appeared between the third and ninth years after the explosions, amongst patients who were located at distances from 0·62 to 1·6 miles from ground-zero. In this connection Stone, R., at the 1955 Geneva Conference stressed the dangers of development of leukæmia amongst personnel producing, handling and transporting radio - active materials or controlling ultimate disposal of radio-active wastes. The 1956 M.R.C. pamphlet on nuclear hazards stressed the same dangers.

The chapter on pathology focuses on histological studies of 110 autopsies of casualties (ninety-four from Hiroshima, sixteen from Nagasaki). In spite of the wealth of material made available from such pathological specimens the factors responsible for death from effects of *severe* ionizing radiation (especially those patients dying within the first two weeks after exposure) still remain unsolved.

The contributions of infection, hæmorrhage and the syndrome of " shock " towards lethality still remain unassessed. Nor has the possible influence of one damaged organ upon another been evaluated.

The contemporary anxieties on the possible effects of ionizing radiation on the fœtus and germ plasm are reflected in the higher abortion and still-birth rates amongst pregnant Japanese women located near the explosions, i.e. 23 per cent of such women who were within 2,000 metres of ground-zero and also manifested radiation syndromes. Subsequent editions of this book would be assisted by reports from the Atomic Bomb Casualty Commission's pædiatric clinics, where studies were made on anomalies occurring both in children exposed *in utero* and during early infancy. The anthropometric studies of Plummer, Wright, Reynolds, etc., on physical growth, skeletal maturation, intelligence tests, etc., have direct bearings upon these problems.

Appendices include studies of the methods of estimating the distributions of the two populations concerned, methods of estimating total casualties, and to date the most detailed breakdown of types and degrees of illness correlated to the distance (and available shielding) from ground-zero; a detailed description is given of the methods adopted by the A.B.C.C. in studying each individual casualty.

This is a most exhaustive study of the medical sequelæ of the nuclear attacks on Japan in 1945, and should be read by all armed forces or civilian medical authorities concerned with defence against nuclear attacks; also by students of radiation-biology.

A. MENECES.

OLD AGE

Clark, F. le Gros & Dunne, Agnes C. *Ageing in Industry*. London, 1955. Nuffield Foundation. Pp. vii + 146. Price 6s.

OWING to the change in the population distribution, the increase in pension facilities enabling more people to retire and the difficulties associated with the medico-social care of old people and other factors, there has been a greatly increased interest in problems of the ageing. To the elucidation of these problems, the Nuffield Foundation have made a useful contribution, with emphasis being placed particularly on the industrial aspects.

The report opens with a question it seeks to answer. " At what ages are men compelled, by reason of their age alone, to quit the occupations in which they have spent their working lives? " The authors emphasize the point that it is now necessary to make a more realistic approach to the employment